Low-input, high-output dairy-beef heifer systems

with Dr. Ellen Fitzpatrick,
Johnstown Castle Research Centre, Teagasc

National Beef Conference 2023

Tuesday, 21st November | 5pm

Shearwater Hotel, Ballinasloe, Co. Galway

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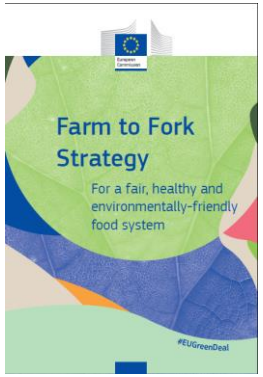
Introduction

- Policy ambition to reduce slaughter age (3 months) and N use (20%) on Irish farms
  - Can slaughter age be reduced from grass-based diet?
  - Can low N systems support high levels of output?
- High attrition rate of farmers engaged in dairy-beef production
  - Variable levels of animal and financial performance



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Why do we need to reduce slaughter age and N use?

- To reduce:
  - Greenhouse gas emissions and nitrate leaching
  - Imports of fertiliser and feed
  - Cost

Benefits of increasing sward diversity

Herbage production

Biological N fixation

Animal performance

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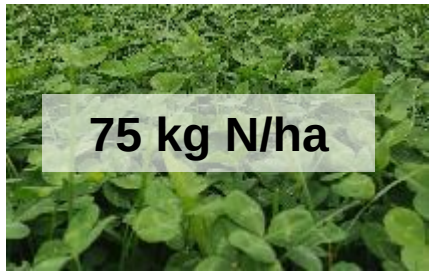
Johnstown Castle Research 2021-2023

- **Objective:**
  - **Determine the physical and financial performance of early-maturing breed dairy-beef heifers consuming contrasting pasture types**



2.5 LU/ha (182 kg organic N/ha)

All pasture treatments were managed identically (PBI, rotation length, spring/autumn management)

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N fertiliser application strategy

Date (Rotation)	PRG (150 kg N/ha)	CLOVER (75 kg N/ha)	MSS kg N/ha)
February/March	20		
April	40		
May	20		
June	20		
July	15		
August	20		
September	15		15

Management

- Calves purchased at 20 weeks of age
- 159 kg
- 16th Feb

- Pre-grazing herbage mass 1300-1600 kg DM/ha
- 5 cm post grazing sward height

- Housed in November
- Fed grass silage *ad libitum* – pasture treatments
- 1.25 kg concentrate

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Animal Measurements

- Heifers were weighed every 2 weeks

- BCS ≥ 3.75 →

  Drafted for slaughter


Pasture
Same grazing management across the three treatments
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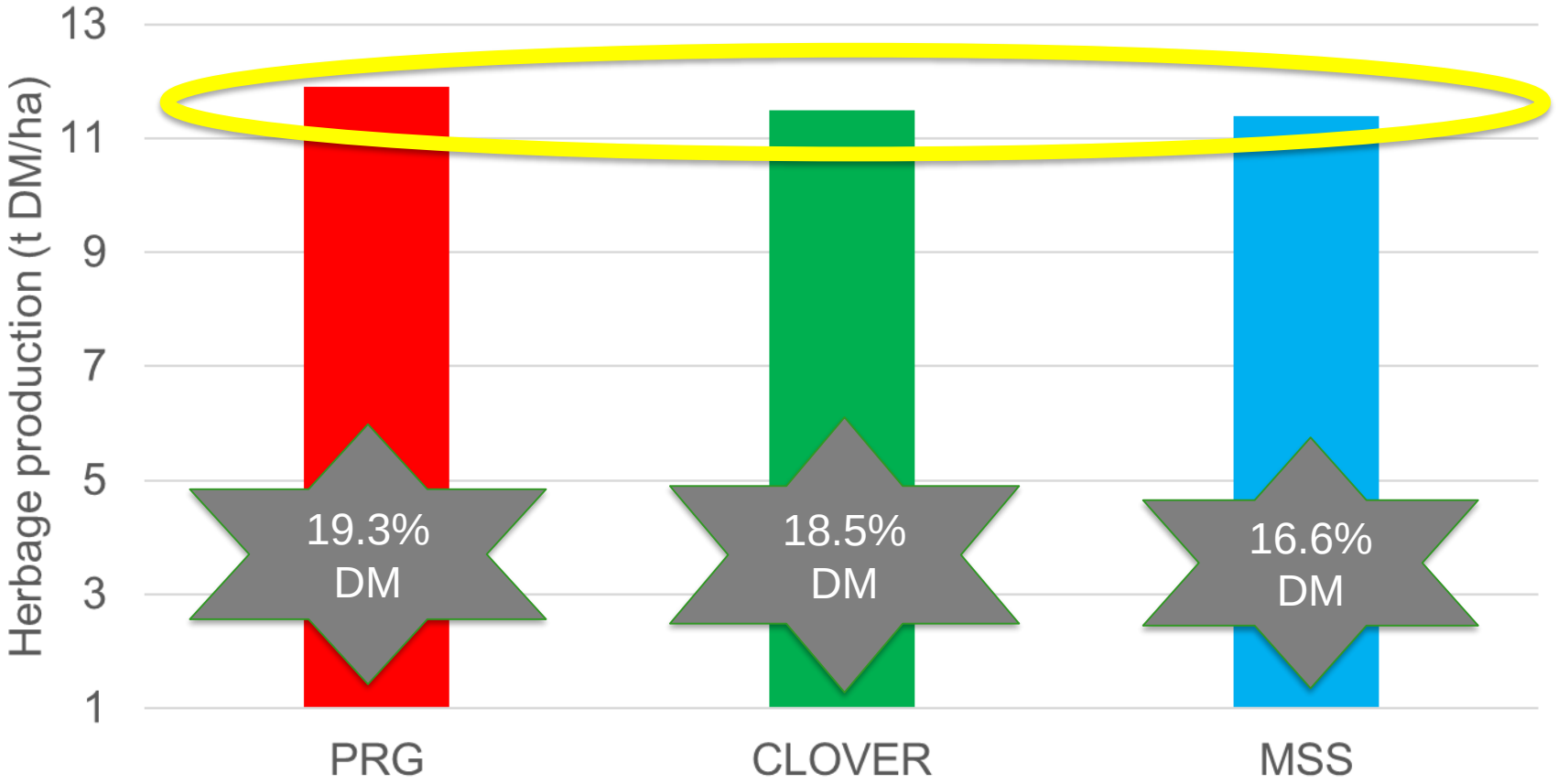
Herbage production



- Similar herbage production with 50% less chemical N fertiliser
- 1557 kg DM/ha pre-grazing herbage mass
- 4.9 cm post-grazing sward height

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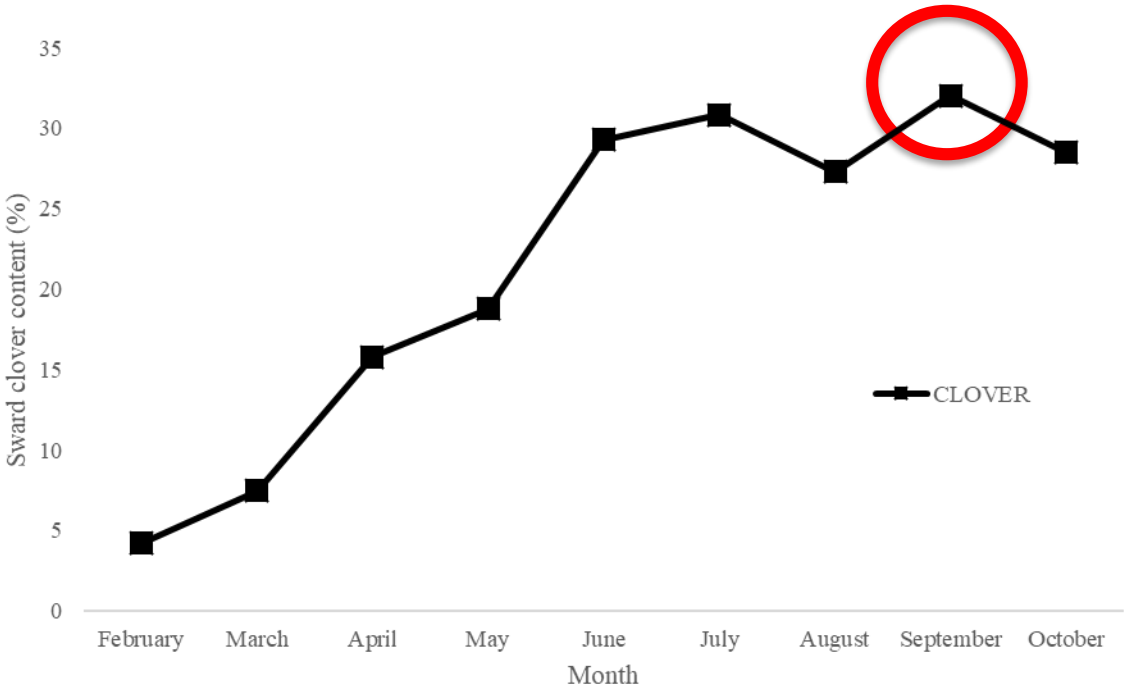
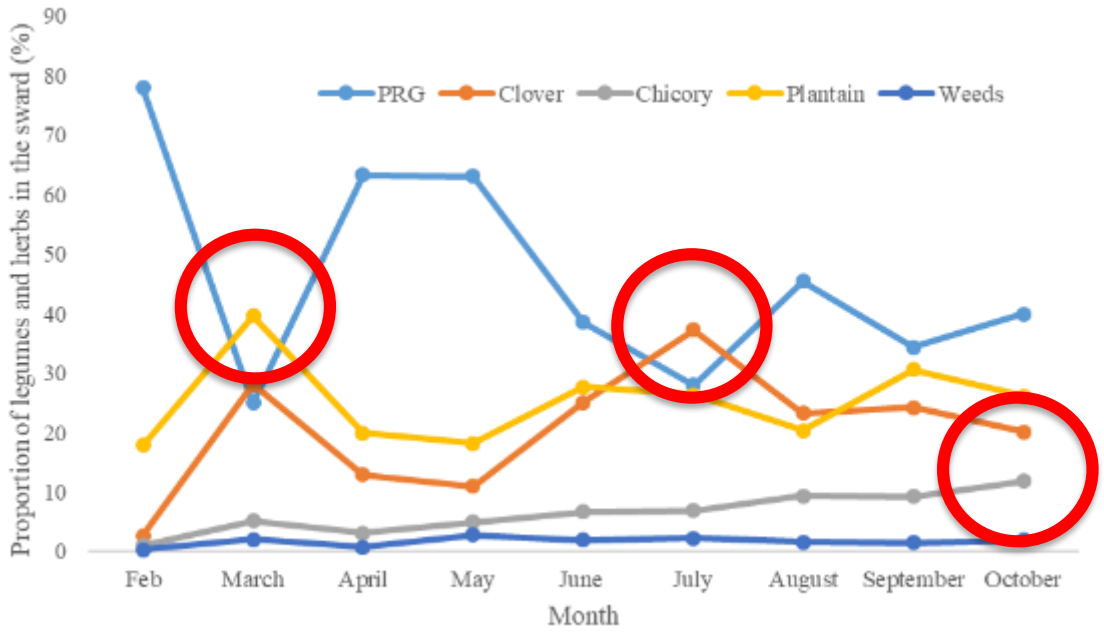
Sward Composition





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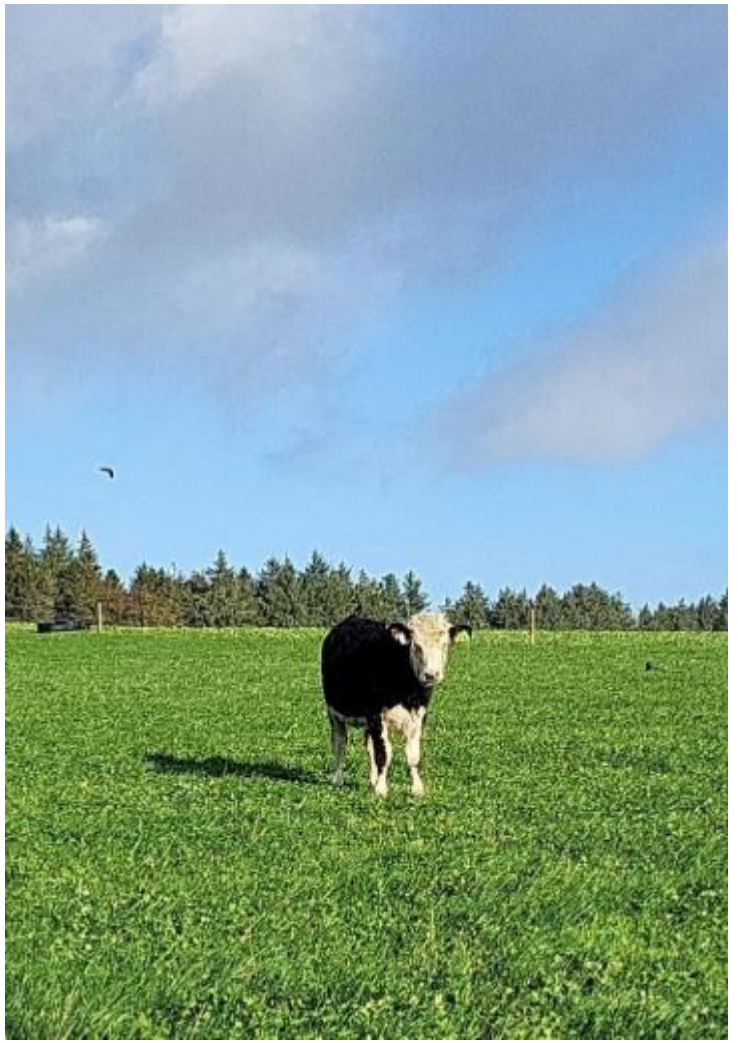
Does pasture type affect animal performance?



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Live weight performance

	PRG	CLOVER	MSS	SEM	Significance
ADG (kg/day)					
1st grazing season	0.61[a]	0.62[a]	0.79[b]	0.052	***
1st winter	0.65 [a]	0.65 [a]	0.68 [a]	0.031	NS
2nd grazing season	0.81[a]	0.92[b]	0.87[b]	0.019	***
Lifetime	0.74[a]	0.78[b]	0.79[b]	0.010	**

Concentrate fed

1st grazing season

1 kg

1st winter

1.25 kg

2nd grazing season

No meal fed

PRG
68% drafted

CLOVER
86% drafted

MSS
75% drafted

Finishing period

4 kg

PRG
306 kg conc

CLOVER
266 kg conc

MSS
287 kg conc

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Slaughter performance

	PRG	CLOVER	MSS	SEM	Significance
Age (months)	19.6^{a}	19.2^{a}	19.2^{a}	6.5	NS
Slaughter weight (kg)	482^{a}	492^{b}	490^{b}	5.4	*
Kill-out (%)	50^{a}	51^{a}	51^{a}	0.1	NS
Carcass weight (kg)	243^{a}	250^{b}	249^{b}	2.7	*
Conformation score (1-15)	5.0^{a}	5.2^{a}	5.2^{a}	0.11	NS
Fat score (1-15)	8.0^{a}	8.5^{b}	8.6^{b}	0.19	**

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Summary

- **Incorporating clover and herbs into your system can:**
  - **Improve animal performance**
  - **Reduce age of slaughter**
  - **Reduce N fertiliser application**
  - **Increase profit**

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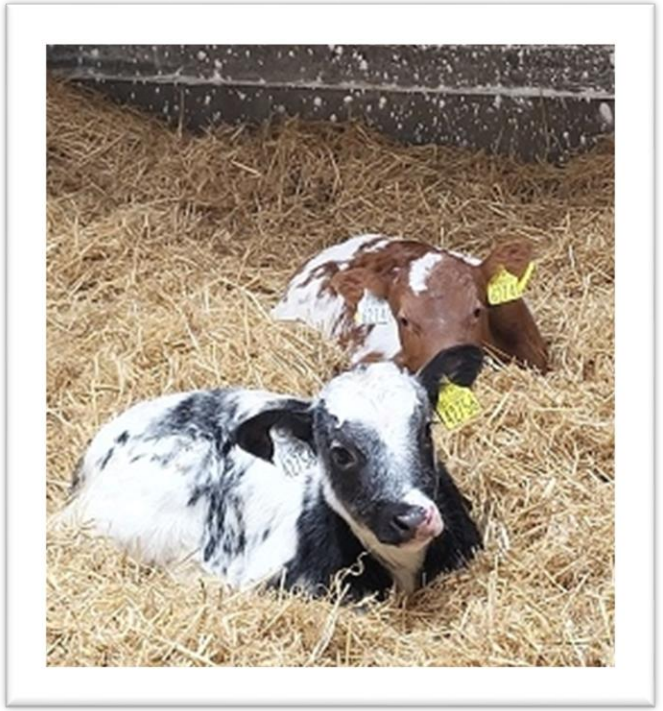
IMPROVED SUSTAINABILITY!

New study spring 2023

- Using established pasture treatments
- 3 (pasture type) * 2 (maturity) * 3 (Slaughter age) factorial design
  - Two animal maturity levels
    - » Early maturing
      - Angus and Hereford
    - » Late maturing
      - Limousin and Belgian Blue
  - Serial slaughter arrangement
    - » 16, 19 and 22 months at slaughter



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